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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/716,858	11/19/2003	Gary R. Flauaus	MCD128	7100

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EXAMINER
NEURAUTER, GEORGE C

ART UNIT	PAPER NUMBER
2143	

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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

	Application No.	Applicant(s)
	10/716,858	FLAUAUS ET AL.
Office Action Summary	Examiner	Art Unit	
	George C. Neurauter, Jr.	2143	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE <u>3</u> MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.
- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on <u>19 November 2003</u>.

2a)☐ This action is **FINAL**.   2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) <u>1-24</u> is/are pending in the application.

    4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) <u>1-24</u> is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

    Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

    Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

    a)☐ All b)☐ Some * c)☐ None of:

      1.☐ Certified copies of the priority documents have been received.

      2.☐ Certified copies of the priority documents have been received in Application No. _____ .

      3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

    * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1)☒ Notice of References Cited (PTO-892)

2)☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)

3)☒ Information Disclosure Statement(s) (PTO/SB/08)
    Paper No(s)/Mail Date <u>12/4/2003</u>.

4)☐ Interview Summary (PTO-413)
    Paper No(s)/Mail Date. _____ .

5)☐ Notice of Informal Patent Application

6)☐ Other: _____ .

DETAILED ACTION

Claims 1-24 are currently presented and have been examined.

Information Disclosure Statement

The information disclosure statement (IDS) submitted on 4
December 2003 was filed before an action on the merits. The
submission is in compliance with the provisions of 37 CFR 1.97.
Accordingly, the information disclosure statement is being
considered by the examiner.

Specification

In the preliminary amendment filed 12 December 2003, on
pages 2 and 3, paragraph 0062 is replaced twice with two
different amended paragraphs. While it is evident that the
Applicant intended to replace paragraphs 0062 and 0063, the
Applicant is requested to resubmit the amendment in order to
clarify the record.

Claim Rejections - 35 USC § 112

The following is a quotation of the second paragraph of 35
U.S.C. 112:

> The specification shall conclude with one or more claims particularly
> pointing out and distinctly claiming the subject matter which the applicant
> regards as his invention.

Claims 1-9 are rejected under 35 U.S.C. 112, second
paragraph, as being indefinite for failing to particularly point

out and distinctly claim the subject matter which applicant

regards as the invention.

Claims 1 and 6-8 recite the limitation "port statistics".

This limitation has insufficient antecedent basis within the

claim.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs

of 35 U.S.C. 102 that form the basis for the rejections under

this section made in this Office action:

A person shall be entitled to a patent unless -

(b) the invention was patented or described in a printed publication in this or
a foreign country or in public use or on sale in this country, more than one
year prior to the date of application for patent in the United States.

(e) the invention was described in (1) an application for patent, published
under section 122(b), by another filed in the United States before the
invention by the applicant for patent or (2) a patent granted on an
application for patent by another filed in the United States before the
invention by the applicant for patent, except that an international
application filed under the treaty defined in section 351(a) shall have the
effects for purposes of this subsection of an application filed in the
United States only if the international application designated the United
States and was published under Article 21(2) of such treaty in the English
language.

Claims 1-3, 7, 10-12, 18-22, and 24 are rejected under 35

U.S.C. 102(b) as being anticipated by US Patent 6,381,642 B1 to

O'Donnell et al.

Regarding claim 1, O'Donnell disclosed a switch for use in

a data storage network ("fibre channel"), comprising:

a plurality of ports each comprising a receiving device for

receiving data from a link connected to the port and a

transmitting device for transmitting data onto another link connected to the port; (see at least column 1, lines 52-60)

a plurality of control circuits each associated with one of the ports, wherein each of the control circuits collects data traffic statistics and port state information for the associated port; memory for storing a congestion record for each of the ports; (see at least column 2, lines 47-52 and column 4, lines 40-52)

and a congestion analysis module ("management director") gathering at least a portion of the data traffic statistics and port state information for the ports, performing computations with the gathered port statistics and port state information to detect congestion at the ports, and updating the congestion records for the ports with detected congestion. (see at least column 4, lines 30-52) (see also column 5, Table 2, wherein the congestion analysis module updates information regarding "number of class 3 frames discarded", "number of link failures", and "frame pacing limit")

Regarding claim 2, O'Donnell disclosed the switch of claim 1, wherein the module periodically repeats the gathering, the performing, and the updating upon expiration of a sample time period. (see at least column 4, lines 63-67)

Regarding claim 3, O'Donnell disclosed the switch of claim 2, wherein the congestion records comprise counters for a set of congestion types and the updating of the congestion records comprises incrementing the counters for the ports for which the detected congestion corresponds to one of the congestion types. (see at least column 2, lines 47-52 and column 4, lines 40-52) (also note column 5, lines 1-25, wherein the counters count an accumulated "number" of a certain value and are therefore "incremented")

Regarding claim 7, O'Donnell disclosed the switch of claim 1, wherein the gathered port statistics and port state information include separate sets of data for the receiving device and the transmitting device for the ports and wherein the performing computations comprises detecting congestion for the ports in the receiving device and the transmitting device based on the separate sets of data. (see at least column 4, lines 46-62, wherein each of the ports has its own associated separate set of data collected)

Regarding claim 10, O'Donnell disclosed a method of managing congestion in a data storage fabric having a set of switches with input/output (I/O) ports and links connecting the ports for transferring digital data through the fabric, comprising:

receiving a first set of congestion data from the switches

in the fabric, the first set comprising port-specific congestion

data for the ports in the switches at a first time; receiving a

second set of congestion data from the switches in the fabric,

the second set comprising port-specific congestion data for the

ports in the switches at a second time; and processing the first

set and the second set of congestion data to determine a level

of congestion at the ports. (see at least column 2, lines 35-39

and 47-52, column 4, lines 40-52, and column 6, lines 28-48)

(also note column 1, lines 15-46; the disclosures of O'Donnell

cover a plurality of switches and therefore, multiple sets of

data can be received by multiple switches)

Regarding claim 11, O'Donnell disclosed the method of claim

10, wherein the processing comprises determining a change in the

congestion data between the first and the second.times. (see at

least column 2, lines 12-20)

Regarding claim 12, O'Donnell disclosed the method of claim

11, wherein the determined change is used to update a set of

congestion counters for each of the ports of each of the

switches. (see at least column 4, lines 30-52)

Regarding claim 18, O'Donnell disclosed the method of claim

10, wherein the processing includes determining a source of the

congestion in the fabric based on the congestion data. (see at

least column 2, lines 12-20)

Regarding claim 19, O'Donnell disclosed a method for

managing congestion in a fabric having a plurality of multi-port

switches, comprising:

at each switch in the fabric, monitoring bi-directional

traffic pattern data for each switch port for indications of

congestion and when congestion is indicated for one of the

switch ports, updating a congestion record for the congested

port based on the monitored traffic pattern data; (see at least

column 2, lines 47-52 and column 4, lines 30-52) (also note

column 1, lines 15-46; the disclosures of O'Donnell cover a

plurality of switches)

operating the switches to transfer at least portions of the

congestion records from each of the switches to a network

management platform; and at the network management platform,

processing the transferred portions of the congestion records to

determine a congestion status for the fabric. (see at least

column 2, lines 35-39 and 47-52, column 4, lines 40-52, and

column 6, lines 28-48)

Regarding claim 20, O'Donnell disclosed the method of claim

19, further comprising performing congestion recovery comprising

initiating manual intervention procedures or transmitting a

congestion alleviation command to one of the switches based on the determined congestion status for the fabric. (see at least column 2, lines 12-20)

Regarding claim 21, O'Donnell disclosed the method of claim 19, wherein the processing comprises detecting a delta between the transferred portions of the congestion records and a set of previously received congestion records, and further wherein the congestion status comprises a congestion level and a congestion type for congested ones of the ports. (see at least column 2, lines 12-20 and 47-52 and column 4, lines 40-52)

Regarding claim 22, O'Donnell disclosed the method of claim 21, wherein the processing further includes determining a source of congestion in the fabric based on the types of congestion at the ports. (see at least column 2, lines 12-20)

Regarding claim 24, O'Donnell disclosed the method of claim 19, wherein the monitoring at the switches is performed independently in a received direction and in a transmit direction for each of the ports. (see at least column 4, lines 46-62)

Claims 1, 3, 7, and 8 are rejected under 35 U.S.C. 102(e) as being anticipated by US Patent Application Publication 2005/0030893 A1 to Dropps et al.

Regarding claim 1, Dropps disclosed a switch for use in a data storage network ("fibre channel"), comprising:

a plurality of ports each comprising a receiving device for receiving data from a link connected to the port and a transmitting device for transmitting data onto another link connected to the port; (see at least paragraphs 0030 and 0094)

a plurality of control circuits each associated with one of the ports, wherein each of the control circuits collects data traffic statistics and port state information for the associated port; memory for storing a congestion record ("counter") for each of the ports; and a congestion analysis module gathering at least a portion of the data traffic statistics and port state information for the ports, performing computations with the gathered port statistics and port state information to detect congestion at the ports, and updating the congestion records for the ports with detected congestion. (see at least paragraphs 0147-0153 and 0161-0164)

Regarding claim 3, Dropps disclosed the switch of claim 2, wherein the congestion records comprise counters for a set of congestion types and the updating of the congestion records

comprises incrementing the counters for the ports for which the

detected congestion corresponds to one of the congestion types.

(see at least paragraphs 0161-0164, particularly paragraph 0162)

Regarding claim 7, Dropps disclosed the switch of claim 1,

wherein the gathered port statistics and port state information

include separate sets of data for the receiving device and the

transmitting device for the ports and wherein the performing

computations comprises detecting congestion for the ports in the

receiving device and the transmitting device based on the

separate sets of data. (see at least paragraph 0145)

Regarding claim 8, Dropps disclosed the switch of claim 1,

wherein the memory further stores a set of congestion threshold

values and wherein the performing congestion detection

computations with the module comprises determining whether the

gathered port statistics and port state information exceed the

congestion threshold values. (see at least paragraphs 0038,

0150-0151 and 0163)

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which

forms the basis for all obviousness rejections set forth in this

Office action:

> (a) A patent may not be obtained though the invention is not identically
> disclosed or described as set forth in section 102 of this title, if the
> differences between the subject matter sought to be patented and the prior
> art are such that the subject matter as a whole would have been obvious at

the time the invention was made to a person having ordinary skill in the
art to which said subject matter pertains. Patentability shall not be
negatived by the manner in which the invention was made.

The factual inquiries set forth in *Graham* v. *John Deere*

Co., 383 U.S. 1, 148 USPQ 459 (1966), that are applied for

establishing a background for determining obviousness under 35

U.S.C. 103(a) are summarized as follows:

1.   Determining the scope and contents of the prior art.
2.   Ascertaining the differences between the prior art and
      the claims at issue.
3.   Resolving the level of ordinary skill in the pertinent
      art.
4.   Considering objective evidence present in the
      application indicating obviousness or nonobviousness.

This application currently names joint inventors. In

considering patentability of the claims under 35 U.S.C. 103(a),

the examiner presumes that the subject matter of the various

claims was commonly owned at the time any inventions covered

therein were made absent any evidence to the contrary.

Applicant is advised of the obligation under 37 CFR 1.56 to

point out the inventor and invention dates of each claim that

was not commonly owned at the time a later invention was made in

order for the examiner to consider the applicability of 35

U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior

art under 35 U.S.C. 103(a).

Claim 6, 9, and 16-17 are rejected under 35 U.S.C. 103(a)
as being unpatentable over O'Donnell in view of US Patent
7,275,103 B1 to Thrasher et al.

Regarding claim 6, O'Donnell disclosed the switch of claim
1, wherein the gathered port statistics comprise TX link
utilization, RX link utilization, queuing latency, internal port
transmit busy timeouts, Class 3 frame flush counters/discard
frame counters, and destination statistics. (see at least column
5, Table 2, particularly "number of" words and frames received
and transmitted, "number of class 3 frames discarded", "number
of link failures", "frame pacing limit", and "number of link
failures")

O'Donnell did not expressly disclose the use of TX
BB_Credit levels, RX BB_Credit levels, configured RX BB_Credit,
or link distance as port statistics, however, Thrasher discloses
these port statistics in the context of monitoring ports within
a switch in a data storage network (see column 4, lines 34-50).

It would have been obvious to one of ordinary skill in the
art at the time the invention was made to use the port
statistics as described in Thrasher to monitor the switch as
described in O'Donnell since such port statistics are used to
monitor ports within a switch in a data storage network as both
described in O'Donnell and Thrasher and, therefore, using the

port statistics as described in Thrasher would have predictably

resulted in a switch that monitors its ports for the statistical

information as described in Thrasher.

Regarding claim 9, O'Donnell disclosed the switch of claim

1.

O'Donnell did not expressly disclose the switch further

comprising generating a Congestion Threshold Alert (CTA)

indicating one or more congestion statistics to a log or

management interface, however, Thrasher does disclose this

limitation in the context of data storage network switches and

the monitoring of its ports for congestion information (see at

least column 4, lines 51-56 and column 6, lines 41-63).

It would have been obvious to one of ordinary skill in the

art at the time the invention was made to combine the teachings

of these references since the combination of the switch of

O'Donnell to include the functionality of generating an alert to

a log or management interface would have been predictably

successful to one of ordinary skill in the art since O'Donnell

discloses providing information to a management interface from a

switch (see at least column 2, lines 12-20). Therefore, to

integrate the functionality of the switches of these references

would have been obvious to one of ordinary skill and would have

predicted a successful combination.

Regarding claim 16, O'Donnell disclosed the method of claim 10.

O'Donnell did not expressly disclose generating a congestion status display for viewing on a user interface comprising a graphical representation of the data storage fabric, the congestion status display including congestion indicators corresponding to the determined levels of congestion at the ports, however, Thrasher did disclose these limitations (see at least column 15, line 59-column 16, line 48).

One of ordinary skill would have found it obvious that using generating a user interface to display the congestion information to a user would enable a user to observe the operation of the network and be able to enact changes in order to avoid network congestion which is the main objective of both references. Therefore, it would have been obvious to one of ordinary skill to combine the teachings of these references to achieve such an improved system.

Regarding claim 17, O'Donnell and Thrasher disclose the method of claim 16.

O'Donnell disclosed wherein the congestion data comprises detected types of congestion for the ports and the congestion status display includes congestion type indicators. (see at least column 2, lines 47-52 and column 4, lines 40-52)

Claims 13 and 14 are rejected under 35 U.S.C. 103(a) as
being unpatentable over O'Donnell in view of Dropps.

Regarding claim 13, O'Donnell disclosed the method of claim
12.

O'Donnell did not expressly disclose wherein the level of
congestion is determined by comparing the congestion counters to
threshold levels for a set of congestion types, however, Dropps
did disclose these limitations in the context of monitoring
congestion within a switch (see at least paragraphs 0038, 0150-
0151 and 0163).

One of ordinary skill would have found it obvious to
combine the teaching of these references since the use of
thresholds enables the triggering of some action in the event of
some sort of existing condition such as a problem within a
system such as network congestion as described in both O'Donnell
and Dropps. Since both O'Donnell and Dropps monitor congestion
within a switch, one of ordinary skill would have predicted that
the use of thresholds in the switch of O'Donnell would determine
a level of congestion to the extent that congestion would then
be able to be detected. Therefore, it would have been obvious to
achieve the claimed invention.

Regarding claim 14, O'Donnell and Dropps disclosed the method of claim 13.

O'Donnell disclosed displaying on a user interface at least a portion of the congestion counters (see at least column 2, lines 12-20 and column 6, lines 40-59).

O'Donnell did not expressly disclose receiving from a user interface at least a portion of the threshold levels, however, O'Donnell does disclose receiving from a user interface configuration information concerning monitoring information within a switch (see at least column 4, lines 53-62). Dropps discloses threshold levels as described above regarding claim 13.

It would have been obvious to one of ordinary skill in the art to send threshold levels from a user interface to a switch to allow the switch to accept threshold levels from a user interface in order to set the switch to trigger in the event of congestion in a manner that is desired by a user monitoring the switch in order to detect congestion in the manner disclosed by O'Donnell.

Claims 4, 5, 15, and 23 are rejected under 35 U.S.C. 103(a)
as being unpatentable over O'Donnell in view of Dropps and in
further view of US Patent 7,151,744 B2 to Sarkinen et al.

Regarding claim 4, O'Donnell disclosed the switch of claim
3.

O'Donnell discloses wherein the congestion types comprise
resource limited congestion. (see column 5, Table 2,
specifically "frame pacing limit")

O'Donnell did not expressly disclose backpressure
congestion and over-subscription congestion types, however,
Dropps did disclose over-subscription congestion as a statistic
used to monitor switches (see at least paragraphs 0044-0045,
0186 and 0191).

One of ordinary skill in the art would have found it
obvious to use over-subscription congestion as a congestion type
since it is known in the art as shown in Dropps that over-
subscription is a common type of congestion experienced by
switches within a data storage network (see at least paragraph
0082) and to monitor for such congestion in the context of
monitoring congestion as described in both O'Donnell and Dropps
would have predictably resulted in a switch that is able to
monitor for more known congestion types.

O'Donnell and Dropps did not expressly disclose a
backpressure congestion type, however, Sarkinen did disclose
backpressure congestion (see "backpressure" as referred to
throughout the reference).

One of ordinary skill in the art would have found it
obvious to use backpressure congestion as a congestion type
since it is known in the art as shown in Sarkinen (see at least
column 18, lines 51-59) that over-subscription is a common type
of congestion experienced by switches within a data storage
network and to monitor for such congestion in the context of
monitoring congestion as described in O'Donnell, Dropps, and
Sarkinen would have predictably resulted in a switch that is
able to monitor for more known congestion types.

Claims 15 and 23 are also rejected since these claims
recite substantially the same limitations as recited in claim 4.

Regarding claim 5, O'Donnell, Dropps, and Sarkinen
disclosed the switch of claim 4.

O'Donnell, Dropps, and Sarkinen did not expressly disclose
wherein the module performs a second gathering of a second
portion of the data traffic statistics for ones of the ports for
which the detected congestion has the backpressure congestion
type of congestion and then processes the second portion of the

data traffic statistics to identify a source of backpressure

within the switch.

One of ordinary skill in the art would have found it

obvious to collect more data traffic statistics when

backpressure is detected in order to determine the source of the

backpressure within the switch since it is within the knowledge

of one of ordinary skill in the art concerning backpressure as

it is known that backpressure occurs when an queue of a switch

is overloaded since the queue's buffers are full and cannot

receive data without dropping information and the sending of

information to the queue is stopped. Based on the sending of

information to the queue, it can be determined which

transmitting port is causing the backpressure by observing which

transmitting ports within the switch are sending the information

to the queue. Therefore, by use of the data statistics used in

O'Donnell, it would have been predictable by one of ordinary

skill that using additional data traffic statistics would help

determine the cause of the backpressure and, therefore, relieve

the backpressure and avoiding congestion within the switch.

Conclusion

It is noted that the column, line, and/or page number

citations used in the prior art references as applied by the

Examiner to the claimed invention are for the convenience of the

Applicant to represent the relevant teachings of the prior art.
The prior art references may contain further teachings and/or
suggestions that may further distinguish the citations applied
to the claims, therefore, the Applicant should consider the
entirety of these prior art references during the process of
responding to this Office Action. It is further noted that any
alternative and nonpreferred embodiments as taught and/or
suggested within the prior art references also constitute prior
art and the prior art references may be relied upon for all the
teachings would have reasonably suggested to one of ordinary
skill in the art. See MPEP 2123.

The prior art listed in the PTO-892 form included with this
Office Action disclose methods, systems, and apparatus similar
to those claimed and recited in the specification. The Examiner
has cited these references to evidence the level and/or
knowledge of one of ordinary skill in the art at the time the
invention was made, to provide support for universal facts and
the technical reasoning for the rejections made in this Office
Action including the Examiner's broadest reasonable
interpretation of the claims as required by MPEP 2111 and to
evidence the plain meaning of any terms not defined in the
specification that are interpreted by the Examiner in accordance

with MPEP 2111.01. The Applicant should consider these cited

references when preparing a response to this Office Action.

Any inquiry concerning this communication or earlier

communications from the examiner should be directed to George C.

Neurauter, Jr. whose telephone number is 571-272-3918. The

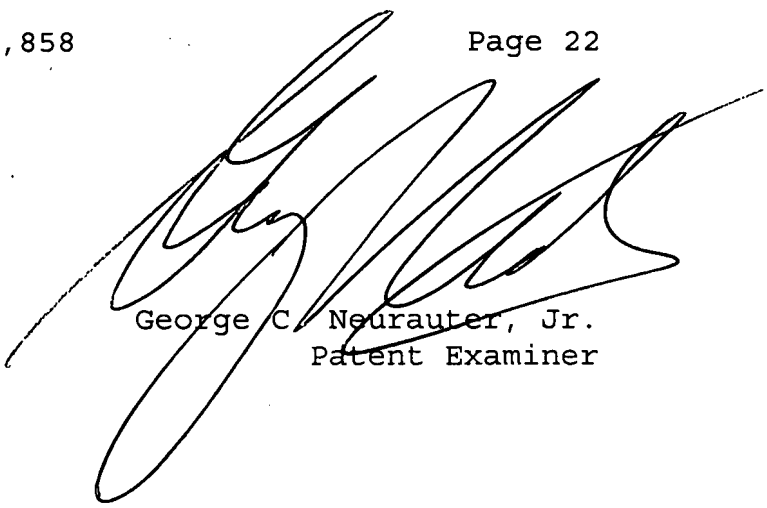examiner can normally be reached on Monday-Friday 9am-5:30pm.

If attempts to reach the examiner by telephone are

unsuccessful, the examiner's supervisor, David Wiley, can be

reached on 571-272-3923. The fax phone number for the

organization where this application or proceeding is assigned is

571-273-8300.

Information regarding the status of an application may be

obtained from the Patent Application Information Retrieval

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access to the Private PAIR system, contact the Electronic

Business Center (EBC) at 866-217-9197 (toll-free). If you would

like assistance from a USPTO Customer Service Representative or

access to the automated information system, call 800-786-9199

(IN USA OR CANADA) or 571-272-1000.

George C. Neurauter, Jr.
Patent Examiner